

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of)

Yoshiaki Taguchi)

Application No.: 10/576,957)

Filed: April 25, 2006)

For: THERMOPLASTIC RESIN)
COMPOSITION AND)
INJECTION-MOLDED ARTICLE)
THEREOF)

Group Art Unit: 1796

Examiner: JOHN E. USELDING

Appeal No.: _____

APPEAL BRIEF

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This appeal is from the decision of the Primary Examiner dated September 19, 2008 finally rejecting claims 1 to 20, which are reproduced as the Claims Appendix of this brief.

☐ A check covering the ☐ \$ 270 ☐ \$ 540 Government fee is filed herewith.

☒ Charge ☐ \$ 270 ☒ \$ 540 to Credit Card. Form PTO-2038 is attached.

The Commissioner is hereby authorized to charge any appropriate fees under 37 C.F.R. §§1.16, 1.17, and 1.21 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 02-4800.

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I. Real Party in Interest

The present application is assigned to POLYPLASTICS CO., LTD., and the Assignee is the real party in interest.

II. Related Appeals and Interferences

The Appellant legal representative, or assignee, does not know of any other appeal or interferences which will affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

III. Status of Claims

Claims 1 to 20 have been twice rejected, and the rejection of Claims 1 to 20 is being appealed.

IV. Status of Amendments

No amendments have been submitted subsequent to the initial Preliminary Amendment filed April 25, 2006.

V. Summary Claimed Subject Matter

Applicant has provided through empirical research a novel specifically defined thermoplastic composition that displays a highly advantageous combination of properties as discussed in Applicant's Specification. Independent Claim 1 and dependent Claims 1 to 9, and 12 to 18 are directed to a thermoplastic resin composition. The claimed composition is capable of being molded to form a thin-

walled product unlike many thermoplastic compositions. Dependent Claims 10, 11, 19 and 20 are directed to injection-molded articles formed from the thermoplastic resin composition. This advantageous molding characteristic is made possible through the limited inclusion of a liquid crystalline polymer, and makes possible excellent mechanical strength, satisfactory absence of mold deposit, advantageous heat resistance, and flame retardance. All of these benefits are provided in combination, and unlike the prior art are now made possible by Applicant. It is contemplated that the specific named ingredients be combined in specific concentrations in order to satisfy the parameters for Applicant's claimed contribution.

As stated in independent Claim 1, the thermoplastic resin composition is prepared by the compounding of specified amounts of components (A), (B), (C), and (D). Component (C) is comprised of stated amounts of (C-1) and (C-2). Each of these components is identified with greater specificity hereafter. All page and line numbers correspond to those of the Substitute Specification filed on April 25, 2006.

Component (A) is 100 parts by weight of a thermoplastic resin which does not form an anisotropic melt phase. See [0008] at Page 4, lines 8 to 22, where this commonly inexpensive thermoplastic component is discussed. Preferred examples of (A) are polycarbonate resin, polyethylene terephthalate resin, polybutylene terephthalate resin, etc.

Component (B) is 15 to 45 parts by weight of a commonly more expensive and non-conventional thermoplastic which is a liquid crystalline polymer that does form an anisotropic melt phase. See [0009] to [0016] at Page 4, line 23 through Page 7, line 17. A preferred liquid crystalline polymer contains main structural units derived from p-hydroxybenzoic acid and 6-hydroxy-2-naphthoic acid.

Components (C-1) and (C-2) in a specified combination comprise Component (C) which serves as a flame-retardant component. (C-1) is a phosphor-based flame retardant and is provided in a concentration of 5 to 20 parts by weight. (C-2) is a silicone rubber and is provided in a concentration of 1 to 15 parts by weight. See [0017] to [0024] at Page 7, line 18 through Page 9, line 18, for a discussion of (C-1). See [0025] at Page 9, line 18 through Page 10, line 6, for a discussion of (C-2). The concentrations of (C-1) and (C-2) are subject to the further proviso that the ratio of (C-1)/(C-2) ranges from 1 to 2. See [0027] at Page 10, lines 13 to 15.

Component (D) is a filler. See [0028] to [0030] at Page 10, line 16 through Page 11, line 12.

The preferred (C-1) phosphor-based flame retardant of dependent Claims 2 and 12 to 20 is discussed at [0020] and [0021] at Page 8, line 14 through Page 9, line 3.

The preferred (C-2) silicone rubber formed by cross-linking organopolysiloxane of dependent Claims 3 and 12 is discussed at [0025] at Page 9, last line, through Page 10, line 3.

The preferred particle diameter for the (C-2) silicone rubber of 1 to 20 μm of dependent Claims 4 and 13 is discussed at [0025] at Page 10, lines 4 to 6.

The optional presence of 0.1 to 1 part by weight of the (E) dispersing agent of dependent Claims 5 and 15 is discussed [0033] at Page 12, lines 1 to 3.

The preferred phosphorous oxo acid monoester dispersing agent (E) of dependent Claim 6 is discussed [0033] at Page 11, line 18 to end of page.

The preferred polycarbonate thermoplastic resin (A) which does not form an anisotropic melt phase of dependent Claims 7 and 16 is discussed at [0008] at Page 8, lines 21 to 22.

The optional presence of 0.1 to 1 part by weight of a fluorine-based resin (F) of dependent Claims 8 and 17 is discussed at [0034] at Page 12, lines 9 to 24.

The preferred inclusion of a glass fiber filler (D) of dependent Claims 9 and 18 is discussed at [0029] at Page 11, lines 1 and 2.

The injection-molded article of dependent Claims 10 and 19 and the thin-walled housing of dependent Claims 11 and 20 are discussed at [0038] and [0039] at Page 13, line 24, through Page 14, line 11.

VI. Grounds of Rejection to be Reviewed on Appeal

Whether thermoplastic resin composition Claims 1 to 9, and 12 to 18, and injection-molded article Claims 10, 11, 19 and 20, including the combination of highly advantageous results that are made possible, are properly rejected as being directed to obviously apparent subject matter under 35 U.S.C. § 103(a) over the different teachings of U.S. Patent No. 5,091,135 to Okada et al. in view of the dissimilar subject matter of U.S. Published Patent Application No. 2002/0151624 to Kobayashi.

VII. Argument

The rejection of Claims 1 to 20 as obvious under 35 U.S.C. § 103(a) over U.S. Patent No. 5,091,195 to Okada et al. in view of U.S. Published Patent Application No. 2002/0151624 to Kobayashi is lacking sound technical and legal bases.

The Okada et al. primary reference concerns exclusively a melt-processable polyester composition wherein the resin component that is molded is either

exclusively or primarily a relatively expensive aromatic polyester which is capable of forming an anisotropic melt phase. This component of Okada et al. corresponds to component (B) of Applicant's claims which on the contrary must be present in the presently claimed invention in a minor concentration of only "15 to 45 parts by weight" in combination with specific concentrations of other specifically defined ingredients. The teachings of Okada et al. do not concern the concept of the presently claimed invention wherein the primary resin (A) component which is present in a concentration of "100 parts by weight" is a more common thermoplastic resin which does not form an anisotropic melt phase, such as a polycarbonate (dependent Claims 7 and 16). See Paragraph No. [0008] of Applicant's Specification where other more conventional thermoplastic resins suitable for use in the present invention which do not form an anisotropic melt phase are exemplified and are discussed. It readily is acknowledged the Okada et al. at Col. 5, lines 7 to 22, indicates that other thermoplastic resins optionally can be incorporated in the liquid crystal polyester that is there contemplated. Such optional incorporation of another thermoplastic resin which does not form an anisotropic melt phase is never used in any of the working examples of Okada et al., and if ever implemented would always be in a minor concentration so as to not interfere with the patentees' stated objective (i.e., "so far as the object of the present invention is not disturbed"). This is not the concept of Applicant's presently claimed contribution where advantageous results are achieved with the minimal utilization of the relatively expensive LCP. The utilization of a substantial concentration of an LCP component would be contrary to the teachings of Okada, et al. and would not make possible the production of an encapsulated electronic component which displays the overall combination of

advantageous properties now provided by Applicant. See the data provided in the Examples and Comparative Examples present in Applicant's Specification.

The liquid crystalline polymer of Okada, et al. is inherently flame retardant. Accordingly, Okada, et al. is totally lacking in a discussion of the inclusion of a two component flame-retardant, and clearly is lacking in a teaching of the inclusion of (C-1) and (C-2) as presently claimed. In fact, Okada, et al. does not discuss or suggest the inclusion of a flame retardant of any description. This is acknowledged at Page 3 of the Official Action. The silicone utilized by Okada, et al. in the different LCP or primarily LCP composition there contemplated serves a stress relieving function, and there is no discussion of the desirability of including a flame retardant, and certainly no discussion of the inclusion of a two-part flame retardant in specific concentrations as presently claimed in the different composition of Applicant.

A thorough reading of Kobayashi falls short of providing information that is capable of remedying the readily apparent deficiencies of the primary reference. It must be recognized from the title and throughout that Kobayashi merely concerns a dissimilar polycarbonate resin composition which incorporates a phosphate-based flame retardant. Kobayashi never contemplates a composition which includes a liquid crystalline polymer in any concentration, and certainly not a composition wherein both a non-LCP and an LCP are present in the concentrations as presently claimed, with the non-LCP being in the larger concentration, in combination with specific concentrations of other specifically defined ingredients. See further the data present in Applicant's Specification in the working Examples and Comparative Examples which demonstrate the importance of both (C-1) and (C-2) in the specified concentrations in conjunction with the required amounts of (A), (B), and (D). When

both (C-1) and (C-2) are not provided in the specified concentrations, one does not achieve the overall combination of the advantageous properties discussed in Applicant's Specification, including (a) absence of a mold deposit problem, (b) ability to form a thin-walled injection-molded article, (c) reduced cost by minimizing the presence of LCP, (d) mechanical strength, (e) heat resistance, and (f) flame retardance. Such composition and the advantageous results displayed upon injection molding that are made possible by Applicant's specifically claimed contribution could never have been reasonably gleaned or otherwise been capable of prediction by one skilled in the art from the different teachings of the prior art at the time the claimed invention was made. The absence of support for the sweeping obviousness generalizations expressed in the Official Action is apparent from the record on appeal. It takes considerably more than a hindsight reconstruction of different prior art teachings to appropriately defeat patentability under 35 U.S.C. § 103(a) particularly when data is presented in Applicant's Specification that demonstrates the achievement of a combination of advantageous results that was incapable of prediction at the time the invention was made.

No real basis for a finding of *prima facie* obviousness has been presented. The MPEP emphasizes "[a]ll words in a claim must be considered in judging the patentability of that claim against the prior art." MPEP § 2143.03 quoting *In re Wilson*, 424 F.2d 1382, 1385, 163 USPQ 494, 496 (CCPA 1970). It is not sufficient as a matter of law that words can be found in different contexts by the Examiner after a reading of Applicant's teachings when they are not combined or reasonably suggested to be combined as claimed by the authors of the references. See also, KSR Int'l v. Teleflex Inc., 127 S.Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007),

where the U.S. Supreme Court stated that "a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art."

The Official Action apparently fails to recognize that Okada, et al. teaches relatively expensive injection molding firmly based on use of thermoplastic liquid crystalline polymer technology (i.e., one which forms an anisotropic melt phase) where the thermoplastic resin is inherently flame retardant. The different concept of the secondary reference to Kobayashi does not remedy basic deficiencies of the primary reference. Applicant advantageously provides a relatively inexpensive injection- moldable composition based primarily on a more common thermoplastic resin that does not form an anisotropic melt phase that is capable of achieving in combination the overall advantages that are discussed at a substantially reduced cost. These advantages in combination make possible (a) reduced cost, (b) ability to form a thin-walled injection molded article, (c) mechanical strength, (d) satisfactory absence of mold deposit upon injection molding, (d) advantageous heat resistance, and (e) flame retardance. All of these benefits in combination are made possible by Applicant's claimed contribution.

For at least the reasons given above, Appellant respectfully submits that the Examiner has failed to establish a *prima facie* case of obviousness, and that the rejection should be reversed.

VIII. Claims Appendix

See attached Claims Appendix for a copy of the claims involved in the appeal.

IX. Evidence Appendix

None.

X. Related Proceedings Appendix

None.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

Date November 17, 2008

By:



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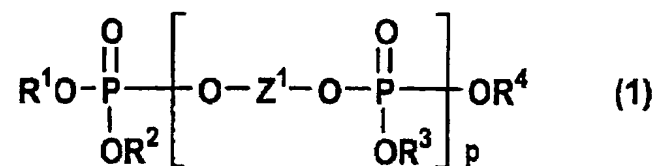
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VIII. CLAIMS APPENDIX

The Appealed Claims

1. A thermoplastic resin composition, prepared by compounding 100 parts by weight of (A) a thermoplastic resin which does not form an anisotropic melt phase, 15 to 45 parts by weight of (B) a liquid crystalline polymer which can form an anisotropic melt phase, (C) a flame-retardant component comprising 5 to 20 parts by weight of (C-1) a phosphor-based flame-retardant and 1 to 15 parts by weight of (C-2) a silicone rubber, and 10 to 80 parts by weight of (D) a filler, wherein a ratio (C-1)/(C-2) ranges from 1 to 2.

2. The thermoplastic resin composition according to Claim 1, wherein (C-1) the phosphor-based flame-retardant is a phosphate ester represented by the following formula (1):



(wherein R^1 to R^4 are each an aryl group which may have a substituent group; Z^1 is a divalent aromatic group; and p is an integer of 1 to 5).

3. The thermoplastic resin composition according to Claim 1, wherein (C-2) the silicone rubber is a silicone rubber formed by cross-linking organopolysiloxane.

4. The thermoplastic resin composition according to Claim 1, wherein (C-2) the silicone rubber has an average particle diameter ranging from 1 to 20 μm .

5. The thermoplastic resin composition according to Claim 1, further compounding 0.1 to 1 part by weight of (E) a dispersing agent relative to 100 parts by weight of (A) the thermoplastic resin.

6. The thermoplastic resin composition according to Claim 5, wherein (E) the dispersing agent is a phosphorus oxo acid monoester or a phosphorus oxo acid diester.

7. The thermoplastic resin composition according to Claim 1, wherein (A) the thermoplastic resin is a polycarbonate resin.

8. The thermoplastic resin composition according to Claim 1, further compounding 0.1 to 1 part by weight of (F) a fluorine-based resin relative to 100 parts by weight of (A) the thermoplastic resin.

9. The thermoplastic resin composition according to Claim 1, wherein at least one of (D) the filler is a glass fiber.

10. An injection-molded article comprising the thermoplastic resin composition according to Claim 1.

11. An injection-molded article for a thin-walled housing comprising the thermoplastic resin composition according to Claim 1.

12. The thermoplastic resin composition according to Claim 2, wherein (C-2) the silicone rubber is a silicone rubber formed by cross-linking organopolysiloxane.

13. The thermoplastic resin composition according to Claim 2, wherein (C-2) the silicone rubber has an average particle diameter ranging from 1 to 20 μm .

14. The thermoplastic resin composition according to Claim 3, wherein (C-2) the silicone rubber has an average particle diameter ranging from 1 to 20 μm .

15. The thermoplastic resin composition according to Claim 2, further compounding 0.1 to 1 part by weight of (E) a dispersing agent relative to 100 parts by weight of (A) the thermoplastic resin.

16. The thermoplastic resin composition according to Claim 2, wherein (A) the thermoplastic resin is a polycarbonate resin.

17. The thermoplastic resin composition according to Claim 2, further compounding 0.1 to 1 part by weight of (F) a fluorine-based resin relative to 100 parts by weight of (A) the thermoplastic resin.

18. The thermoplastic resin composition according to Claim 2, wherein at least one of (D) the filler is a glass fiber.

19. An injection-molded article comprising the thermoplastic resin composition according to Claim 2.

20. An injection-molded article for a thin-walled housing comprising the thermoplastic resin composition according to Claim 2.